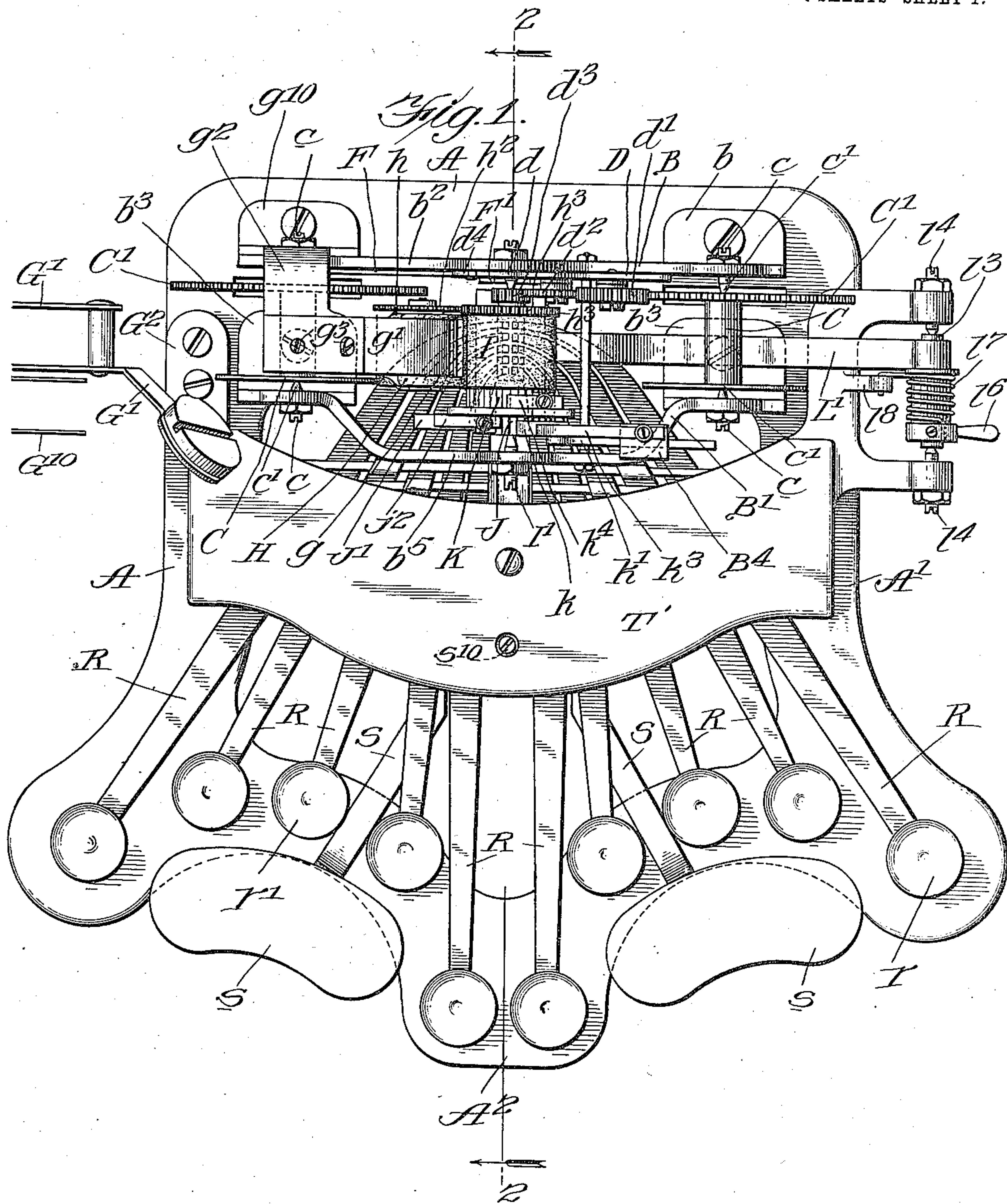


W. J. KEHOE.
STENOGRAPHIC MACHINE.
APPLICATION FILED JAN. 10, 1910.

960,951.

Patented June 7, 1910.

6 SHEETS—SHEET 1.



Witnesses:
P. J. Gathmann.
E. B. Franzoni.

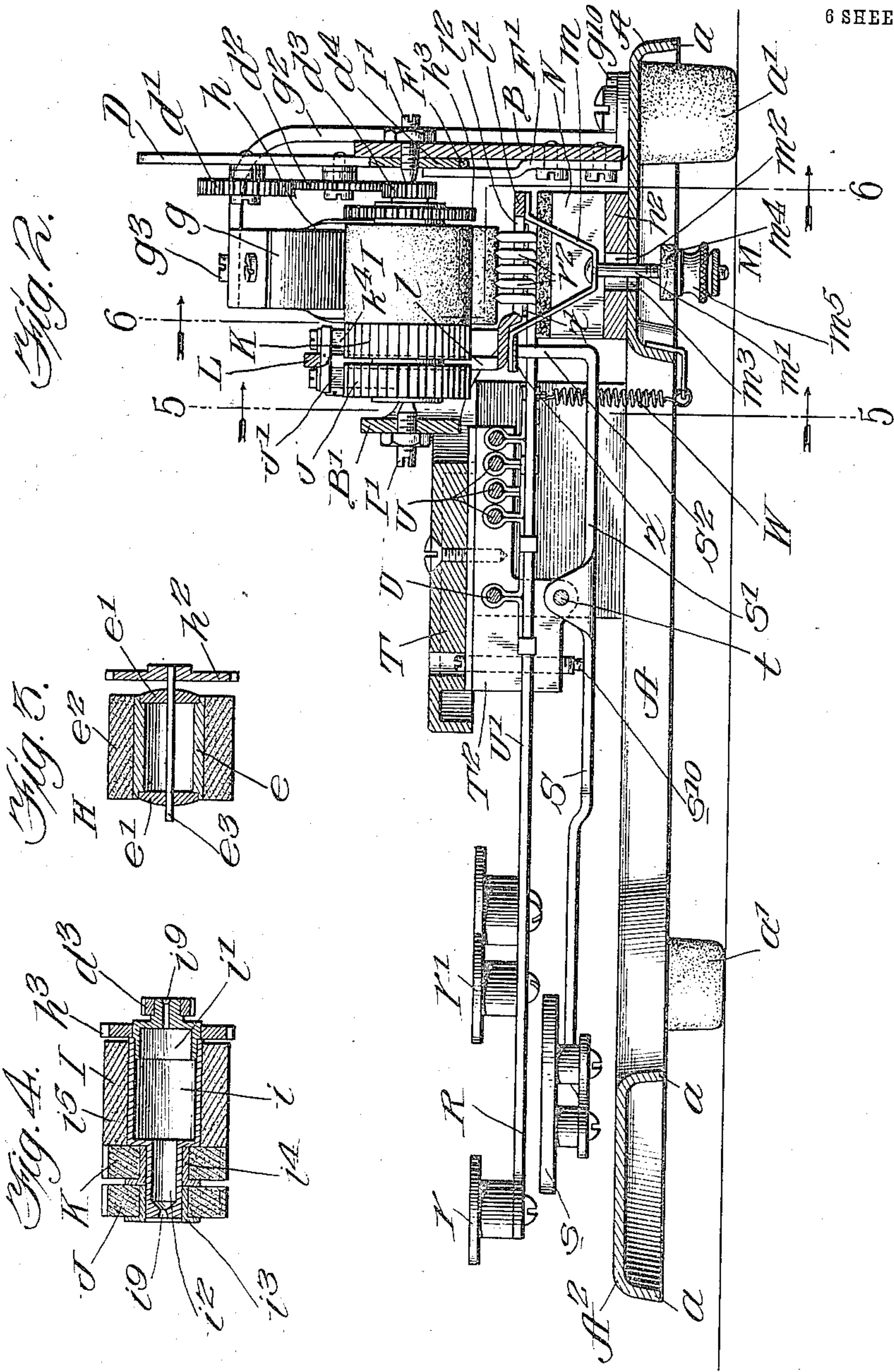
Inventor:
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By his Attorneys:
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6 SHEETS—SHEET 2.



Witnesses:
P. J. Gathmann
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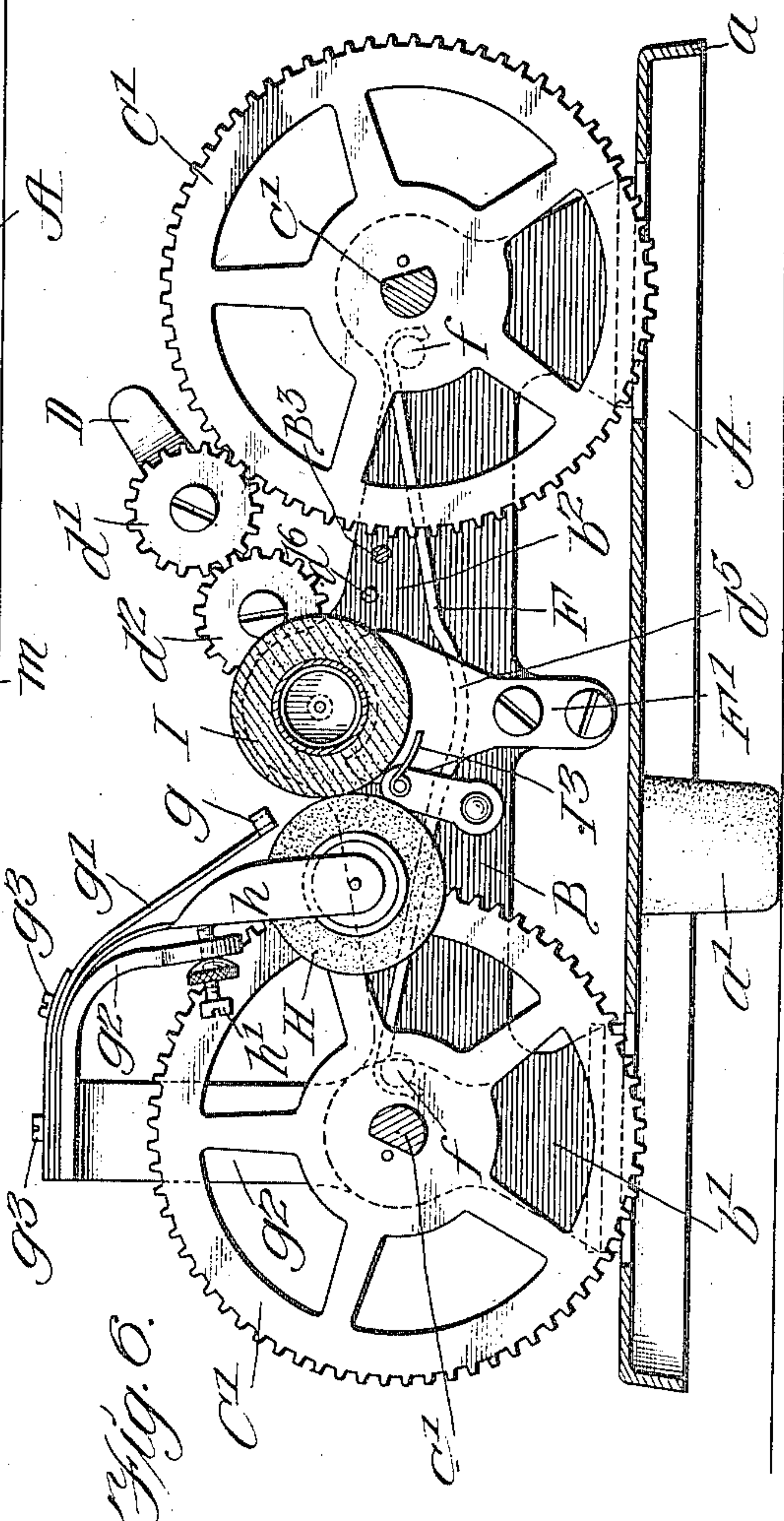
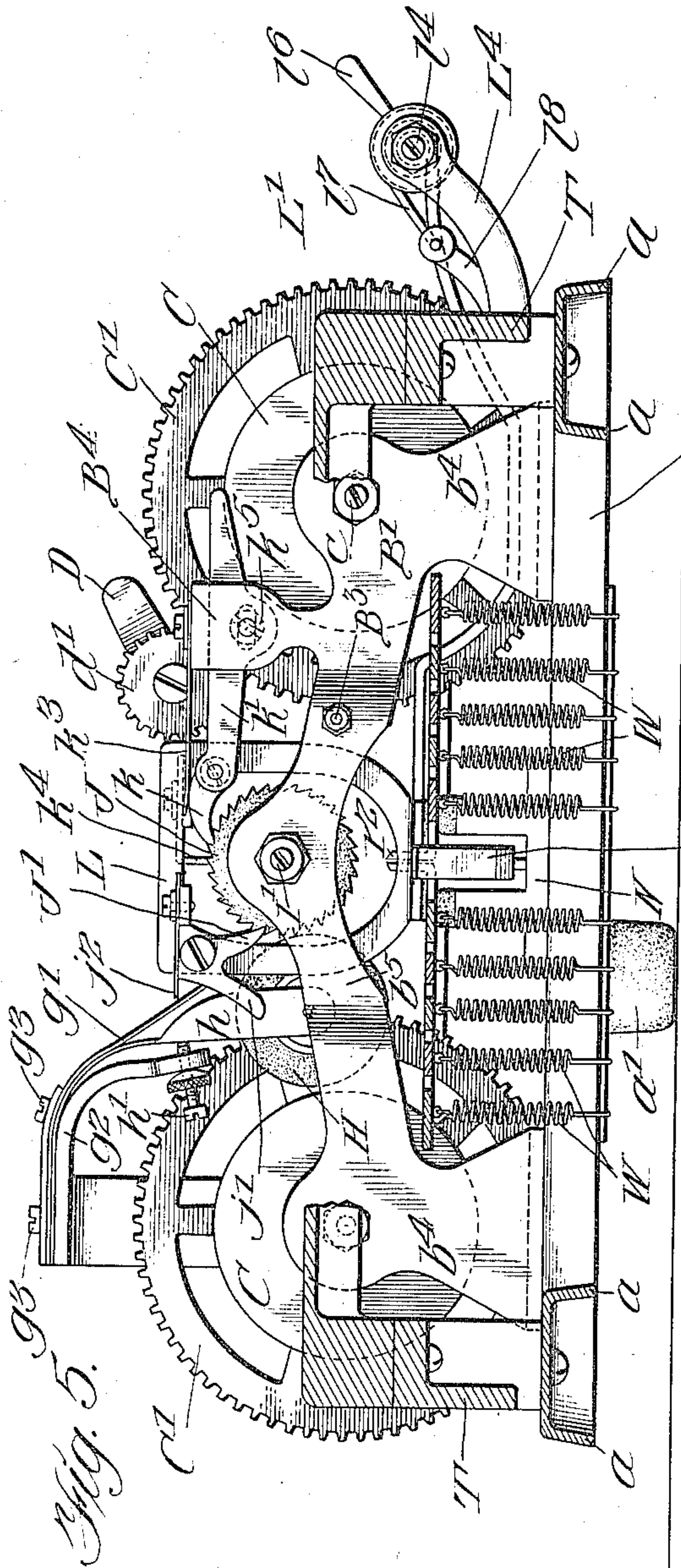
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6 SHEETS—SHEET 3.



Witnesses:
P. J. Gathmann.
C. B. Franconi.

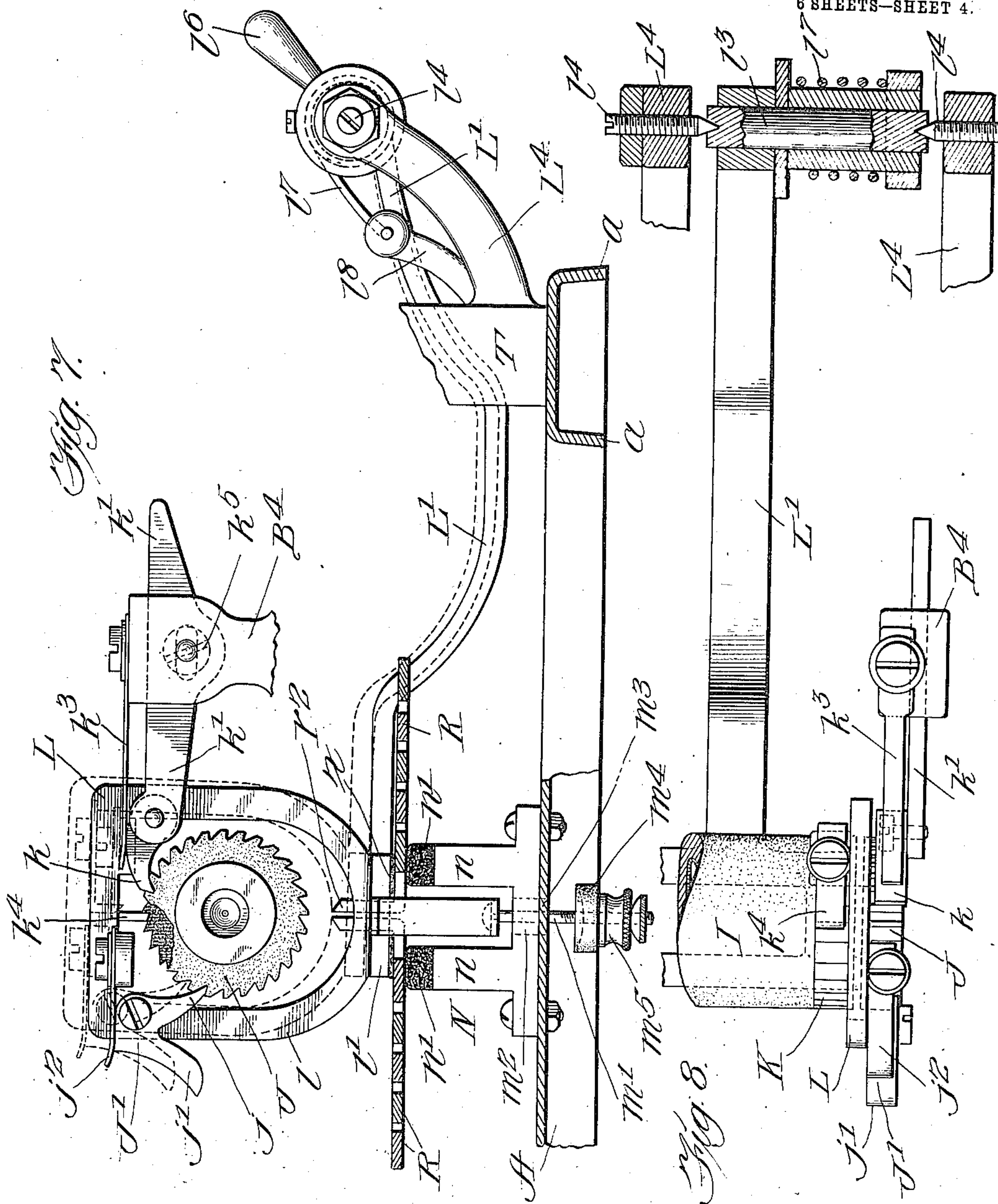
Inventor:
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6 SHEETS—SHEET 4.



Witnesses:
P. J. Gathmann.
C. B. Franzoni.

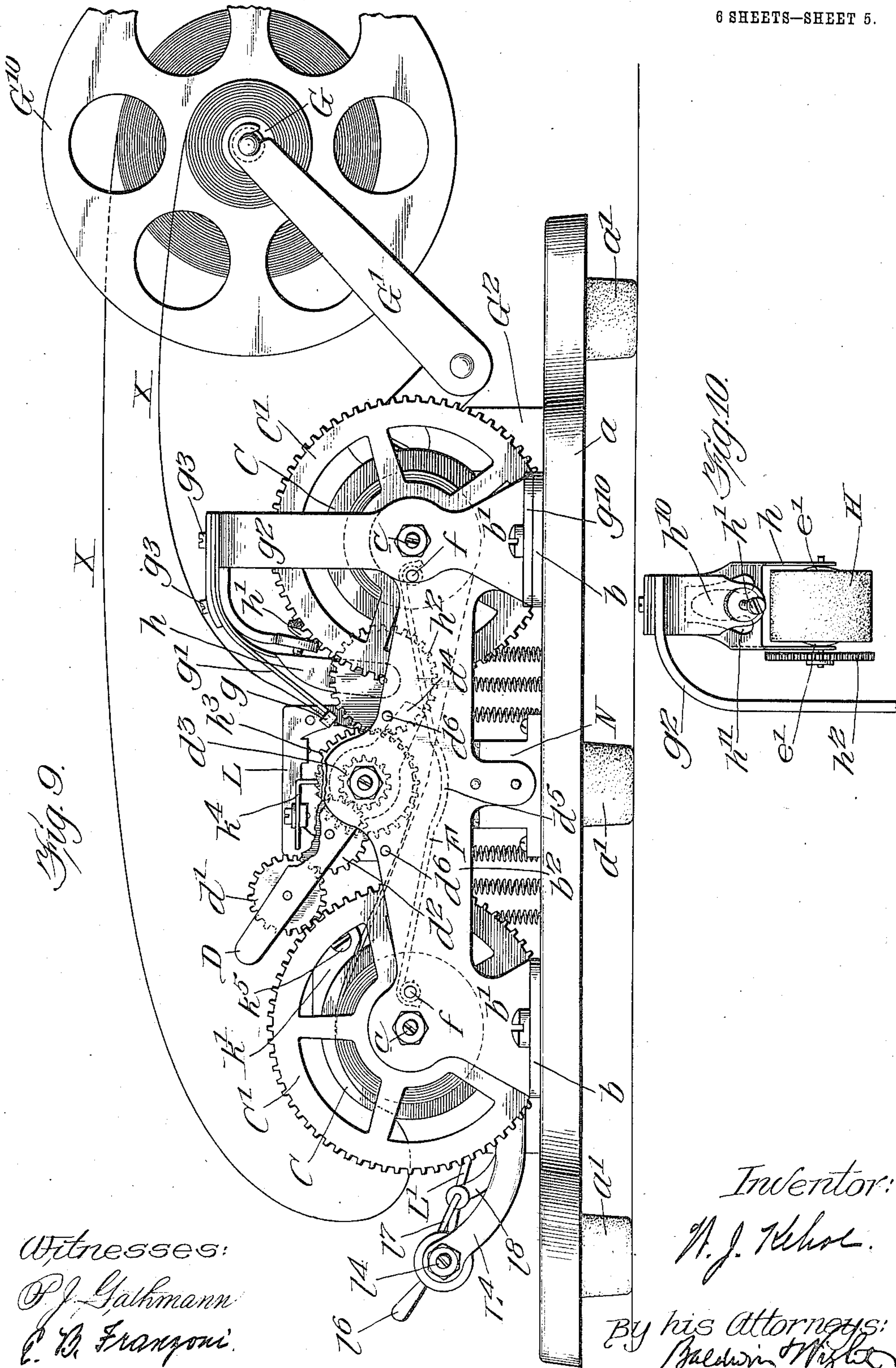
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6 SHEETS—SHEET 5.



Witnesses:
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C. B. Franconi.

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6 SHEETS—SHEET 6.

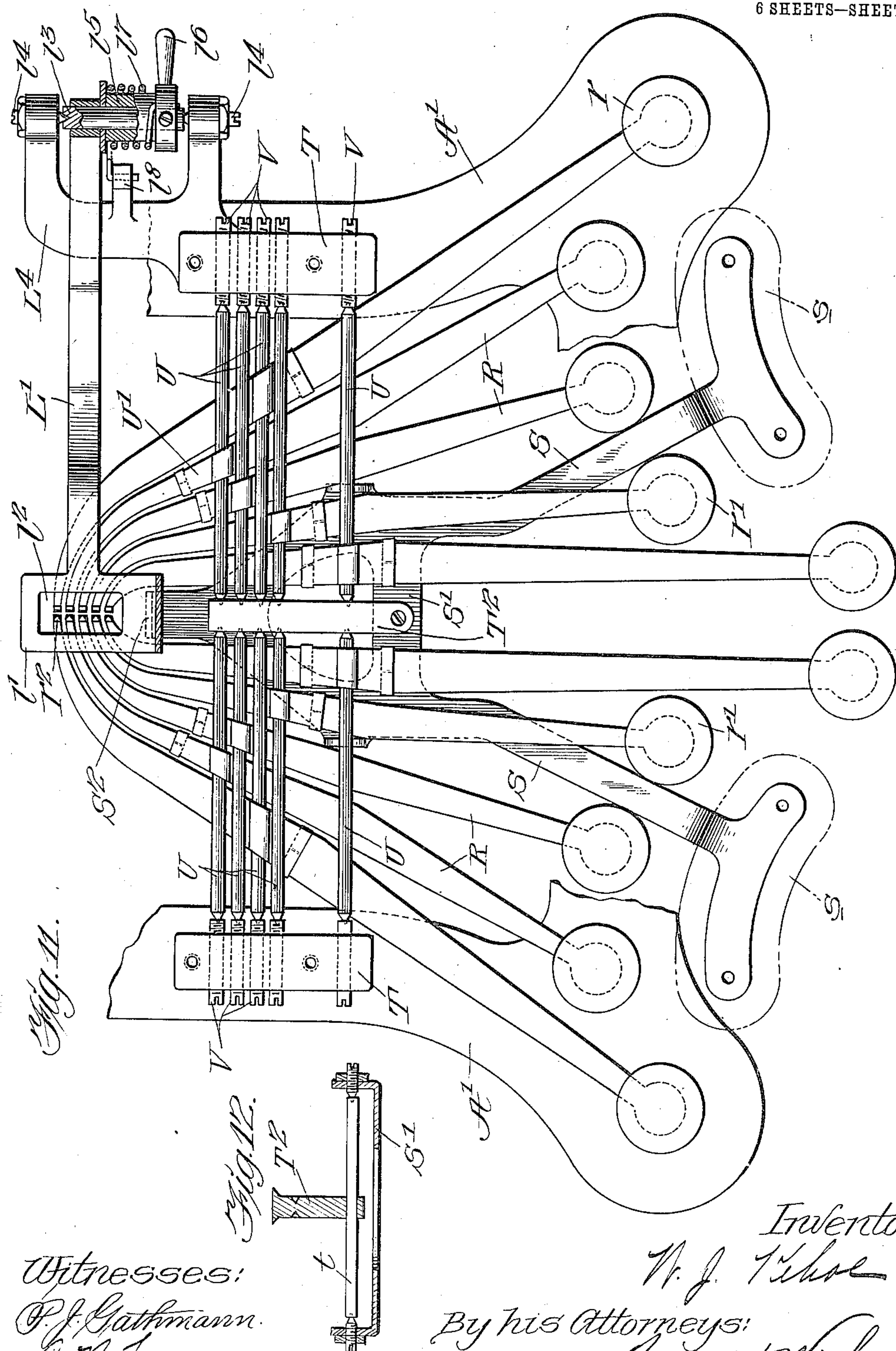


Fig. 11.

Fig. 12.

Witnesses:
P. J. Gathmann.
C. B. Franzoni.

Inventor:
W. J. Kehoe
By his Attorneys:
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UNITED STATES PATENT OFFICE.

WILLIAM J. KEHOE, OF WASHINGTON, DISTRICT OF COLUMBIA.

STENOGRAPHIC MACHINE.

960,951.

Specification of Letters Patent.

Patented June 7, 1910.

Application filed January 10, 1910. Serial No. 537,328.

To all whom it may concern:

Be it known that I, WILLIAM J. KEHOE, a citizen of the United States, residing in Washington, District of Columbia, have invented certain new and useful Improvements in Stenographic Machines, of which the following is a specification.

My present invention relates to stenographic machines of the kind shown in Letters Patent of the United States, No. 940,255, granted to me November 16, 1909 and the primary object of my invention is to so improve machines of this class that they may in a new way be operated noiselessly and with absolute precision in the feed of the paper and the printing of the characters. I have also improved the details of construction of the machine in the manner hereinafter explained.

In the accompanying drawings:—Figure 1 shows a top plan view of a stenographic machine embodying my improvements. Fig. 2 shows a longitudinal or sectional view thereof on the line 2—2 of Fig. 1. Fig. 3 is a detail view in section of the paper feed tension roller. Fig. 4 is a similar view of the combined paper feed roller and platen. Fig. 5 shows a transverse section of the machine on the line 5—5 of Fig. 2. Fig. 6 is a similar view on the line 6—6 of Fig. 2. Fig. 7 is an enlarged detail view in section showing particularly the mechanism for operating the combined paper feed roller and platen. Fig. 8 is a top plan view of the same. Fig. 9 shows a rear elevation of the machine. Fig. 10 is a detail view of the paper feed tension roller and certain parts connected therewith. Fig. 11 is a plan view showing the arrangement of the finger keys, the spacing keys and the manner in which they are mounted. It also shows the feed pawl operating lever and its adjusting devices. Fig. 12 is a detail view in section of the spacing device.

The base or bed plate comprises a back part A, sides A', A', and a front part A², the center or middle part being cut away. This bed plate may be made of sheet metal, flanged as shown at *a* to strengthen it, and it may be supported on feet *a'* made of soft material as usual.

To the back part A of the base are secured front and rear brackets B, B' which support the ribbon spools and paper feed rollers and platen and certain other parts cooperating therewith which will be here-

inafter specified. The rear bracket B is formed at opposite ends with feet *b* which are secured to the bed plate A and these are formed with vertical standards *b'* joined by a connecting plate *b²*. The front bracket B' has feet *b³* secured to the bed plate and standards *b⁴* extending upwardly from the feet and the standards are joined by a connecting plate *b⁵* which is of the form shown in Fig. 1, *i. e.*, it is bent forwardly from the standards at its opposite ends so that its middle portion is held in a vertical plane in front of the standards. The brackets B and B' are spaced a sufficient distance apart to accommodate between them the ribbon spools, the paper feed mechanism and their actuating devices. Preferably one or more rods B³ are employed to connect the brackets, as shown, in order to brace or stiffen them.

The ribbon spools C are supported in the brackets by means of pivot screws *c* having tapered or conical ends fitting corresponding sockets in the axles *c'* of the spools. These screws are adjustable and hold the spools in such manner that they may run freely and noiselessly. Each spool is connected with a vertically arranged spur wheel C' which is adapted to be driven by a train of gears carried by a lever D pivoted at *d* to the rear bracket B intermediate its opposite ends. The outermost spur wheel *d'* is permanently in mesh with an intermediate spur wheel *d²* which meshes with a pinion *d³* attached to the paper feed roller and platen I. The lever is formed with a downwardly projecting arm *d⁴* which bears against a spring bar F resting at opposite ends on pins *f* near the pivots of the spools C and it has midway between its ends a depressed portion *d⁵* directly under the pivot point of the lever D. The arm *d⁴* is adapted to butt against either of the stop pins *d⁶* on opposite sides of the pivot *d*, the arrangement being such that when the lever is thrown over to either side to bring the spur wheel *d'* into engagement with either of the spur wheels C', the lever will be held by the spring F against one of the stops *d⁶* while the spur wheel *d'* is held in engagement with the wheel C'. In this way while the gearing is properly effected undue pressure or friction between the gears *d'* and C' is prevented, and thus the ease with which the machine is operated is materially increased. The lever D with the gears *d*, *d'* may be held in an inoperative position so as to disconnect the gears *d'*, C' by bring-

ing the arm d^4 into engagement with the depressed portion d^5 of the bar F.

F' indicates a plate for guiding the arm d^4 .

The paper ribbon X is drawn from a spool G supported by levers G' pivoted to the bracket G² mounted on the left hand side of the machine and the paper passes through a guide loop g carried by an arm g' attached to a bracket g^2 which also carries a spring plate h in the lower bifurcated end of the downwardly projecting portion of which is mounted a feed roller H. The paper is wound up after being printed upon on a spool G¹⁰. The position of the guide g may be regulated by the adjusting devices g^3 and the position of the feed roller H may be adjusted by means of the set screw h' carried by the bracket g^2 and engaging a tongue h^{10} in the recessed portion h^{11} of the plate h (see Fig. 10). The bracket g^2 extends over the top of the rear bracket B and is formed with a foot g^{10} secured to the bed plate by means of the same screw which secures thereto one of the feet b of the rear bracket B.

The paper feed roller H is preferably constructed in the manner shown in Fig. 3. It comprises a hollow metal bushing e closed at opposite ends by caps e' and it has a covering of hard rubber e^2 . A rod or shaft e^3 extends through the caps and carries on its rear end a spur wheel h^2 meshing with a corresponding wheel h^3 of the same size connected to revolve with the paper feed roller and platen I so that the roller H is driven at the same speed as the roller I which latter roller is of the same diameter as the roller H, and this roller I has a bushing i closed at one end by a cap i' to which the pinion d^3 is secured, and which also carries the pinion h^3 before mentioned. The bushing has at its opposite end a forwardly projecting hollow arm i^2 on which are mounted flanged rings i^3, i^4 carrying the ratchet wheels J and K. The bushing i has a hard rubber covering i^5 and the ratchet wheels J and K are made of hard rubber. The paper passes between the rollers H and I and then over a guide I³ which directs the paper across the plane of the inking ribbon and prevents it from sagging or dropping down below the feed rollers before passing across the type. It will be understood that the paper feed roller I is also the impression roller or platen of the machine.

The roller I is mounted to revolve about a horizontal axis by means of pivot screws I' which extend through the front and rear brackets B, B' in line with the middle longitudinal axis of the machine. These pivot screws are adjustable in the brackets and their inner ends are tapered or coned and fit in corresponding sockets i^9 in the ends of the cap i' and arm i^2 . In this way the feed roller is made to revolve easily and smoothly and as it is hollow its momentum is small

and the feed of the paper is regular and even.

The detent wheel K, which is made of comparatively hard rubber, is rigidly connected with the roller I, and is engaged by a pawl k carried by an arm k' connected to an arm B⁴ projecting upwardly from the front bracket B'. The arm k' is adjustably connected with the bracket arm B⁴ so that the pawl k may be adjusted properly relatively to the ratchet wheel K. A spring k^3 carried by the arm B⁴ bears on the pawl k and holds it yieldingly in engagement with the ratchet wheel K. The arm k' is secured in place by a set screw K⁵. This detent pawl is for the purpose of preventing an overthrow of the ratchet wheel and for also preventing a return movement of the roller I. The detent pawl is assisted in these functions by means of a tooth k^4 carried by the feed frame L which is adapted to engage the ratchet wheel K in the manner shown. As will be hereinafter explained the frame L is moved to a slight extent vertically. When it rises the tooth k^4 is withdrawn from the path of the ratchet wheel K so that the latter may be turned contrariwise to the hands of a watch, but when the frame L descends, the tooth engages the ratchet wheel and holds it firmly against forward movement and it also insures that the two ratchet wheels and the impression roller I shall be moved through the space of one tooth only at each operation. The frame L surrounds the ratchet wheels K and J as clearly shown in Fig. 7, and its vertical part l is connected with a horizontal base portion l' (see Fig. 11) which is provided with a central opening l^2 through which the typed ends of the keys extend, as shown in Fig. 11. This base portion l' is connected with a lever L' extending sidewise at right angles to the axis of the feed roller I and at its outer end this lever is attached to a pivot bar l^3 pivoted at opposite ends to adjustable set screws l^4 mounted in a bracket L⁴ attached to the bed plate of the machine. The pivot screws l^4 have tapered or coned ends entering corresponding sockets in the ends of the bar l^3 . On this bar l^3 is mounted a hub l^5 carrying a handle l^6 to which is adjustably secured the end of a coiled spring l^7 surrounding the hub l^5 and having its opposite ends connected with an arm l^8 projecting from the bracket L⁴. In this way the frame L is pivotally and yieldingly mounted. Normally the spring l^7 depresses or holds down the frame L and when this frame is raised it is raised against the tension of the spring l^7 , which tension may be regulated in the manner before specified.

The upward movement of the frame L is limited by a stop M. This consists of a yoke m rigidly secured to the under side of the base of the frame L and extending down be-

tween the buffers or cushions N. At its lower end the yoke m is attached to a rod m' which extends through an opening m^2 in the base of the buffer and through an opening m^3 in the bed plate A. This rod carries a cushion m^4 of soft material, the position of which may be adjusted by means of an adjusting nut m^5 carried by the rod m' . When the frame L is moved upwardly, the cushion m^4 strikes against the under side of the bed plate and thus limits the vertical movement of the frame. The buffer or cushion N is preferably of the form shown consisting of two members n , the upper ends of which are covered by soft material n' , such as felt, and a base portion n^2 which is attached to the bed plate. The members n are arranged on opposite sides of the yoke m and they are adapted to receive the type bearing ends of the key levers which are arranged, as in my prior patent, on opposite sides of the middle longitudinal axis of the machine.

The ratchet wheel J is engaged by a pawl J' pivotally mounted on the feed frame L. This pawl has a downwardly projecting portion j engaging the ratchet wheel and an outwardly projecting portion j' acting incidentally as a weight to hold the pawl in engagement with the ratchet wheel but principally as a handle by means of which the pawl may be disengaged from the ratchet wheel. A spring j^2 carried by the frame L engages the pawl J' and normally holds it in engagement with the wheel J. The pawl J' is preferably made of fiber, hard rubber or similar material in order to reduce noise to a minimum and actual practice has shown that when such a pawl is used in connection with a ratchet wheel made of hard rubber or similar material the noise of the machine may be considered negligible.

The general arrangement of the key levers R is shown in Fig. 11. Each lever carries at its front end a finger piece r' and each is provided at its rear end with a type r^2 . There are preferably five levers R on each side of the middle longitudinal axis of the machine. One set of levers preferably carries type to mark dots, while the other set carries type to mark dashes and the rear ends of the levers are so formed as to carry the type in a straight line, one behind the other slightly to one side of the middle longitudinal axis of the machine. The faces or upper ends of the type are all normally held in the same horizontal plane and the distance between the two rows of types is considerably less than the distance between the teeth of the ratchet wheel J for the purpose described in my patent before mentioned, and in other patents heretofore granted to me. I also provide spacing key levers S, one on each side of the machine, each having a finger piece s and each connected at its rear end with a spacing

frame S' which is pivotally mounted in the manner hereinafter described and which at its rear end has an upwardly projecting portion s^2 adapted to engage the under side of the base of the frame L which is provided with a cushion of soft material x to prevent noise. A similar cushion x' on the under side of the base of the frame L is provided to prevent the metallic key levers from coming in direct contact with the metallic frame L. In this way the noise, which would be incident to the striking of the keys against the pawl operating frame, is prevented. The upward movement of the front ends of the spacing levers is limited by stops s^{10} . On opposite sides of the machine are mounted on the bed plate standards T to the tops of which are secured a top plate T', to the under side of which midway between its opposite ends is attached a block T² arranged in line with the longitudinal middle axis of the machine. The spacing levers S are pivotally connected to the block T² by a rod t projecting laterally from this block, as clearly shown in Figs. 2 and 12, and the key levers R are pivotally connected with the standards T and the block T² in the manner next to be described.

Each key lever R carries a pivot rod U. Each rod is secured to its key lever preferably by means of a sheet metal clip U' which may be attached to the key lever in any suitable way and which is rigidly attached to the pivot bar. The inner ends of the pivot bars are tapered or coned and enter corresponding sockets in the block T². The outer ends of the pivot bars are also tapered or coned and enter corresponding sockets in the inner ends of the adjustable screws V extending transversely through the standards T. In this way the key levers may be mounted to turn easily and uniformly. The rods being of considerable length there is no danger of such sidewise movement of the key levers as to cause the type r^2 to move out of alinement which is of great importance in my machine. Each key lever is held normally depressed at its rear end by means of a light coiled spring W attached to the under side of the lever and connected to the rear portion A of the bed plate.

The general operation of the machine is similar to that of other machines of this class. It will be understood that the inking ribbon is wound from one spool to the other over the type and beneath the impression roller and that the strip or ribbon of paper is fed beneath the impression roller above the inking ribbon. When the ribbon is wound off from one spool to the other the lever D may be thrown over to the opposite side so as to cause the empty spool to wind the ribbon from the other spool. Each time that a key lever is depressed it not only

causes an impression to be made on the paper, but it also raises the feed plate thus causing the pawl J' to engage a new tooth in the ratchet wheel and when the key thus actuated is released, the pawl carrying frame L descends and the pawl J' engaging the ratchet wheel J causes the feed roller to be turned the space of one tooth to thus actuate the ribbon feed mechanism and also the paper feed mechanism. My machine is so constructed that keys on opposite sides of the machine may be actuated simultaneously or separately so as to simultaneously or separately print dots and dashes. The mechanism is so constructed and arranged that the parts may be operated with great delicacy of touch and with no objectionable noise.

The key levers and the spacing levers can be operated rapidly without being in any way hindered by air pressure. In the machines of my former patents, a spacing plate was provided which, it was found, produced in rapid operation an air pressure which interfered with the action of the machine. By my present improvements this spacing plate is eliminated and is replaced by devices where such air pressure is avoided. I have found that the action of the machine is materially improved by providing a pawl carrying frame which is pivotally mounted at one side of the machine to move about an axis parallel with the axes of the feed rollers.

It will be observed that the pivot bars U are in the same horizontal plane with the under side of the platen I, that is, in the same horizontal plane with the printing point. In this way a better impression and easier action is effected.

I claim as my invention:—

1. In a stenographic machine, the combination of the base plate, the front and rear vertically arranged brackets secured thereto, ribbon spools and paper feed rollers arranged between the brackets, and adjustable pivot screws on which the spools and rollers are mounted.

2. In a stenographic machine, the combination of the base plate, the front and rear vertically arranged brackets secured thereto, a bracing rod connecting said brackets, ribbon spools and paper feed rollers arranged between the brackets, and means for pivotally mounting said spools and rollers.

3. In a stenographic machine, the combination of the base plate, the front and rear vertically arranged brackets secured thereto, ribbon spools mounted between said brackets, a paper feed roller and platen pivotally mounted between the brackets, another paper feed roller between the brackets, a spring plate in which it is mounted having a recessed portion provided with a spring tongue, and a bracket to which said spring

plate is secured and which extends over one of the ribbon spools and is secured to the bed plate behind the rear bracket.

4. In a stenographic machine, the combination of the base plate, the front and rear vertically arranged brackets secured thereto, ribbon spools and paper feed rollers pivotally mounted between the brackets, a ratchet wheel of relatively soft material connected with one of the paper feed rollers, a vertically moving frame also arranged between the brackets, a pawl of relatively soft material engaging said ratchet wheel, a detent pawl mounted on the front bracket, and means for actuating the feed frame.

5. In a stenographic machine, the combination of a paper feed roller and platen, a vertically moving feed frame, a ratchet wheel connected with the feed roller, a pawl carried by the feed frame and engaging the ratchet wheel, and a tooth carried by the frame and also engaging said ratchet wheel.

6. In a stenographic machine, the combination of a paper feed roller and platen, a vertically moving frame, a ratchet wheel connected with the feed roller, a pawl carried by the feed frame and engaging the ratchet wheel, another ratchet wheel connected with the feed roller, a detent pawl engaging it, and a tooth carried by the feed frame engaging one of said ratchet wheels.

7. In a stenographic machine, the combination of a paper feed roller, a vertically moving feed frame, ratchet mechanism connecting the feed roller and the feed frame, a lever extending away from the feed frame in a transverse direction relatively to the axis of the feed roller, means for pivoting said lever to move about an axis parallel with the axis of the feed roller, and means for moving said lever and feed frame vertically.

8. The combination of a paper feed roller, a vertically moving feed frame, ratchet mechanism connecting the feed roller and feed frame, a lever connected with the feed frame and extending transversely relatively to the axis of the feed roller, means for yieldingly and pivotally mounting said lever to move about an axis parallel with the axis of the feed roller, and finger keys mounted to raise the inner end of said lever and to lift the feed frame.

9. The combination of a paper feed roller, a vertically moving feed frame, ratchet mechanism connecting the feed roller and feed frame, a yoke attached to the lower portion of the feed frame, a rod connected therewith, and an adjustable cushion carried by said rod.

10. The combination with a paper feed roller and platen, of two sets of key levers arranged on opposite sides of the middle longitudinal axis of the machine and having two series of types arranged on opposite

sides of said axis, a buffer arranged beneath the type bearing portions of the key levers, a vertically moving feed frame, ratchet mechanism connecting the feed frame with the paper feed roller, a lever connected with said paper feed frame, and means for pivotally mounting said lever.

11. In a stenographic machine, the combination of the bed plate, front and rear vertically arranged brackets, a paper feed roller and platen arranged between said brackets and consisting of a hollow bushing covered with relatively soft material, a vertically moving feed frame surrounding said paper feed roller, a ratchet wheel mounted on said roller made of relatively soft material, a pawl of relatively soft material carried by the feed frame and engaging said ratchet wheel, another ratchet wheel of relatively soft material carried by the feed roller, and a detent pawl cooperating therewith.

12. In a stenographic machine, the combination of the bed plate, a paper feed roller or platen, a vertically moving feed frame, ratchet mechanism connecting the feed frame and platen, two sets of key levers arranged on opposite sides of the machine and

carrying type arranged side by side on opposite sides of the longitudinal axis of the machine, spacing keys adapted to raise the feed frame independently of any movement of the key levers, pivot bars attached to the key levers, and adjustable screws in which the ends of said bars are mounted.

13. In a stenographic machine, the combination of a paper feed roller and platen, a vertically moving feed frame, ratchet mechanism connecting the feed frame and platen, a lever connected with the feed frame, adjustable yielding devices for pivotally mounting said feed frame, spacing keys adapted to raise said feed frame independently of any movement of the key levers, key levers adapted to raise said frame without moving the spacing levers, standards on opposite sides of the bed plate, pivot rods connected with the key levers, and adjustable screws carried by the standards engaging the pivot rods.

In testimony whereof, I have hereunto subscribed my name.

WILLIAM J. KEHOE.

Witnesses:

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M. E. BURRELL.